**AMENDMENTS TO THE CLAIMS:**

1-40. (Canceled)

41.(Currently Amended)      A method for transmitting a signal comprising:

inputting a bit stream;

determining a characteristic of channel fading for a wireless channel;

selecting one of several signal constellations based on the determined characteristic;

converting the input bit stream to symbols of the selected signal constellation to encode the characteristic in an amplitude of the symbols;

modulating a carrier wave in phase and amplitude in accordance with the symbols; and

transmitting the modulated symbols over the wireless channel;

wherein the selected signal constellation consists of a plurality of symbols separated from one another by a maximized minimum conditional distribution that comprises a Kullback-Leibler distance.

42.(Previously Presented)      The method of claim 41, wherein the characteristic of channel fading comprises signal to noise ratio.

43-44.(Canceled)

45.(Previously Presented)      The method of claim 41, wherein determining the characteristic of channel fading is from a signal received over the wireless channel.

46.(Previously Presented)      The method of claim 41, wherein selecting one of several signal constellations is further based on a number of transmit antennas used in the transmitting.

47.( Previously Presented)      The method of claim 46, wherein the number of transmit antennas used in the transmitting is greater than one, and is determined from a message received over the wireless channel.

48.(Previously Presented)     The method of claim 47, wherein the number of transmit antennas is given in a header of the message.

49.(Currently Amended)     A device comprising:

    a transmitter;

    an antenna coupled to the transmitter for transmitting a signal over a wireless channel;

    a storage medium for storing a plurality of signal constellations;

    a processor, coupled to the storage media and the transmitter, for

        determining a characteristic of fading channel fading for the wireless channel;

        selecting one of the plurality of stored signal constellations based on the determined characteristic; and

        converting the input bit stream to symbols of the selected signal constellation so as to encode the characteristic in an amplitude of the symbols; and

    a modulator having an input coupled to an output of the processor and an output coupled to the antenna for modulating a carrier wave in phase and amplitude in accordance with the symbols;

wherein the selected signal constellation consists of a plurality of symbols separated from one another by a maximized minimum conditional distribution that comprises a Kullback-Leibler distance.

50.(Previously Presented)     The device of claim 49, wherein the characteristic of channel fading comprises signal to noise ratio.

51-52.(Canceled)

53.(Previously Presented)     The device of claim 49, further comprising a receiver, and wherein determining the characteristic of channel fading is from a signal received over the wireless channel at the receiver.

54.(Previously Presented)     The device of claim 49, wherein the antenna comprises a plurality of transmit antennas, and wherein selecting one of several signal constellations is further based on a number of the transmit antennas used in the transmitting.

55.(Previously Presented)     The device of claim 55, wherein the number of the transmit antennas used in the transmitting is greater than one, and is determined from a message received over the wireless channel.

56.(Previously Presented)     The device of claim 55, wherein the number of the transmit antennas is given in a header of the message.

57(Currently Amended)     A program of machine-readable instructions, tangibly embodied on an information bearing medium and executable by a digital data processor, to perform actions directed toward transmitting a signal, the actions comprising:

determining a characteristic of channel fading for a wireless channel;

selecting one of several signal constellations based on the determined characteristic;

converting an input bit stream to symbols of the selected signal constellation to encode the characteristic in an amplitude of the symbols;

modulating a carrier wave in phase and amplitude in accordance with the symbols; and

transmitting the modulated symbols over the wireless channel;
wherein the selected signal constellation consists of a plurality of symbols separated from one another by a maximized minimum conditional distribution that comprises a Kullback-Leibler distance.

58.(Previously Presented)     The program of claim 57, wherein the characteristic of channel fading comprises signal to noise ratio.

59-60.(Canceled)

4